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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/784,055

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Robert E. Buxbaum

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EXAMINER

WARTALOWICZ, PAUL A

ART UNIT

PAPER NUMBER

1793

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/784,055	Applicant(s) BUXBAUM, ROBERT E.	
	Examiner PAUL A. WARTALOWICZ	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-22,24,25,27 and 28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-22,24,25,27 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 12/23/08 have been fully considered but they are not persuasive.

Applicant argues that the invention has the attribute of being load following.

However, applicant has not demonstrated why it would be unobvious to combine the secondary stage reactor and the hydrogen membrane as enumerated in the present rejection. It appears that it would have been obvious to make integral the parts of Holland, and that the advantages recognized by the invention would flow from the prior art (including being load following, elimination of the need for a compressor). In response to applicant's argument that the invention has the attribute of being load following, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Additionally, it is reiterated that the embodiment of Holland relied upon does not teach the use of a compressor between the secondary fuel processor and the hydrogen separator (col. 7, lines 46-61). Therefore, there is no teaching in the art that suggests that this particular embodiment could not be made integral. It appears that the simplification and more efficient thermal operation of the claim process as a result of the integration of the separate parts of the components of Holland would be within the realm of one of ordinary skill in the art. *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349

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(CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, "that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice."). MPEP 2144.04 (V)(B).

Additionally, the remarks from previous Office Actions are incorporated herein.

Applicant argues that additional bases exist for the patentability of the subject matter of claims 17-22,24,25,27,28.

However, applicant has not specifically pointed out how the rejection is fallacious with respect to the independent claims. Therefore, the rejections of those claims are maintained.

The Office Action mailed February 4, 2009 included the rejection of claims 16-25 under 35 USC 103 as being unpatentable over Towler (US 6409974) in view of Krumpelt (US 6967063). However, this was a typographical error as the rejection should have been the rejection of claims 16-25 under 35 USC 103 as being unpatentable over Towler (US 6409974) in view of Holland (US 6572837). However, it appears that applicant fully responded to the rejection over Towler (US 6409974) in view of Holland (US 6572837). Therefore, this Office Action is Final.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 16-22, 24, 25, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towler et al. (U.S. 6409974) in view of Holland (US 6572837).

Towler teach a process for forming hydrogen from a feedstock (col. 1) wherein a feedstock is heated with a fuel exhaust stream (col. 10) and then is fed to a reformer and an endothermic product and hydrogen are produced (col. 4, 6) and then fed to a shift reaction zone (col. 7) wherein hydrogen gas and waste gas are produced (col. 8), wherein the waste gas is burned to provide heat to the reformer reaction (col. 8, 9).

As to the limitation of burning feedstock to said burner to provide heat to the reactor, Towler teach that the burner fuel comprises natural gas, which is the

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composition of the feedstock (col. 5, 9). This burner fuel is fed to the combustion zone with combustion gas at efficient conditions (col. 6).

Regarding the limitation of said feedstock is preheated within a pump supplied boiler, it appears that this limitation is a product by process limitation. The product in this case is a preheated feedstock. It appears that the preheated feedstock of the prior art is substantially similar as that of the prior art. When the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct and not the examiner to show the same process of making. *In re Brown* 173 USPQ 685 and *In re Fessman* 180 USPQ 324.

Regarding the limitation of monitoring the temperature and pressure, Towler teach monitoring temperature (col. 6). Although Towler does not explicitly teach monitoring pressure, one of ordinary skill in the art would be motivated to monitor pressure as Towler teach monitoring reaction conditions (col. 6).

Regarding the limitation wherein combustible flow gas is provided stoichiometrically to burn raffinate, one of ordinary skill in the art would recognize the advantages of providing stoichiometric amounts of combustible gas such as efficiency and optimization of the reaction between the combustible gas and the raffinate.

Towler fails to teach that hydrogen is passed through a membrane to thereby separate the hydrogen from the raffinate stream after the water gas shift reaction.

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Towler is drawn to a method of purifying a hydrogen stream for use in a fuel cell (col. 1). Holland is also drawn to a method of purifying hydrogen for use in a fuel cell (col. 4, 5).

Holland teach a method for producing hydrogen (col. 1) wherein two reactions proceed, the first being a reforming reaction and the second being a water gas shift reaction, whereby the product stream of the water gas shift reaction is purified by passing the hydrogen through a hydrogen permeable membrane and leaving the raffinate (col. 4, lines 15-26; col. 7, lines 46-61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide the product stream of the water gas shift reaction is purified by passing the hydrogen through a hydrogen permeable membrane and leaving the raffinate (col. 4, lines 15-26; col. 7, lines 46-61) in Towler in order to purify the product stream of the gas shift reaction as taught by Holland.

Regarding the limitation of placing the hydrogen separator in the secondary fuel processing reactor, it would have been obvious to make integral the parts of Holland. *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, "that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.")

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Towler et al. (U.S. 6409974) in view of Holland (US 6572837) and Thompson (US 5281253).

Towler teaches a process as described above in claim 1.

Towler fails to teach modifying the speed of the feedstock entering the reactor in response to sensing a pressure on a purified hydrogen side of secondary stage membrane reactor.

Holland teaches that the amount of feedstock that can be reformed is limited by partial pressure across the hydrogen separation membrane (col. 2-3).

Thompson teaches a method for controlling systems of membranes (col. 1) wherein an inlet to a membrane system is adjusted based upon the pressure of the outlet (permeate side) of a membrane system for the purpose of raising or lowering the product pressure as needed (col. 3).

As Holland teaches that the amount of feedstock that can be reformed is limited by partial pressure across the hydrogen separation membrane (col. 2-3) and Thompson teaches an inlet to a membrane system is adjusted based upon the pressure of the outlet (permeate side) of a membrane system for the purpose of raising or lowering the product pressure as needed (col. 3), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to control the speed of the feedstock of Towler in order to control the pressure of the hydrogen on the permeate side of the membrane and because it is known that the amount of feedstock that can be reformed is limited by partial pressure across the hydrogen separation membrane and

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because the partial pressure across the hydrogen separation membrane is related to the hydrogen pressure on the permeate side of said membrane.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **PAUL A. WARTALOWICZ** whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz
August 16, 2009

/Stanley Silverman/
Supervisory Patent Examiner, AU 1793